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against, he proceeds to describe his apparatus, which consisted of two thermometers, A and B, of large and nearly equal bulbs graduated to quarters of centigrade degrees, one whitened with a wash of chalk and water, the other blackened with Indian ink. In other experiments a differential thermometer was used, one ball being only exposed to the heating influence under various coatings, and the other carefully screened, so as to reduce the effect as much as possible to that on a mere air thermometer.

A variety of experiments on the heating effects of various flames, incandescent metals, &c., on these thermometers so prepared, and both screened and unscreened with glass plates, are then detailed; and the author then draws his general conclusions, which may be thus stated.

1. That the heat radiated from all luminous hot bodies is divided or analysed by a glass screen into two portions, one of which is stopped by the screen, and employed in increasing its temperature, and the other passes through it without raising its temperature.

2. That besides this difference in the nature of the two portions of the total radiation, they differ in their capabilities of being absorbed by the surfaces of bodies. That portion which passes freely through glass being absorbed much more readily by blackened surfaces, while the other, or non-transmissible portion, is nearly equally well absorbed by black and white surfaces. The texture of surfaces, rather than their colour, he supposes to exercise the chief influence in determining the absorption of this latter portion, though this last-mentioned opinion is, perhaps, rather adopted in conformity with the language of others, than in consequence of any experiments detailed in the present paper.

*On the Anatomy of the Mole-cricket.* *By* J. Kidd, *M.D. and F.R.S. Reg. Prof. of Medicine in the University of Oxford.* Read February 3 and February 10, 1825. [*Phil. Trans.* 1825, *p.* 203.]

The insect described in this paper is common in certain peat bogs a few miles west of Oxford, and is found within 18 inches of the surface. Like the mole, its limbs are particularly calculated for burrowing; and to prevent the necessity of its excavating a passage large enough to admit of its turning round, it has the power of moving as easily in a retrograde as in a progressive direction. Its colour closely resembles that of the mould in which it lives; and in common with many other insects, it has the power of assuming a lifeless appearance when suddenly disturbed. Having kept some of them in glass vessels for several weeks, the author remarked that they preferred the potatoe to other vegetable food, but that they attacked raw meat with especial greediness, and upon emergency attacked each other, in which case the victor soon devoured the fleshy and soft parts of the vanquished. But although they are very voracious, they are equally remarkable for their power of abstaining from food, and have been

kept alive for nine or ten months in garden mould without the possibility of obtaining any other nourishment than such as it might contain.

Having noticed the general habitudes and characters of the insect, Dr. Kidd proceeds to describe its separate parts, and enumerates the peculiarities of the head, thorax, and abdomen. The digestive organs, he observes, more closely resemble those of a graminivorous bird than of any other animal; the œsophagus terminating in a large oval crop, communicating by a muscular tube with the gizzard, which is nearly spherical, and has a thick external muscular coat lined by a glandular membrane, the inner surface of which is divided longitudinally into six equal parts, each furnished with three series of serrated teeth of the hardness of tortoiseshell, and amounting in all to 270.

In his description of the organs of respiration of the Gryllotalpa, D. Kidd states, that ten stigmata are distinctly visible on each side of the body. The first of these, situated near the lower part of the posterior ridge of the thorax, is not like the others a mere dot or point, but an elongated fissure, apparently connected with all the tracheæ both of the thorax and head. To demonstrate the distribution of the tracheæ, the insect was dried in an exhausted receiver, containing muriate of lime, a method applicable to many delicate anatomical preparations; they penetrate every part of the body, and are possibly, in the author's opinion, the instruments of sanguineous circulation in insects, absorbing the blood in the first instance from the internal surface of the alimentary canal, and thence conveying it over the body. No difficulty, he apprehends, attaches to the supposition that such an absorption may take place, seeing that innumerable minute ramifications of the tracheæ penetrate the intestinal canal to every part. If, he continues, it should be urged that the tracheæ are not found charged with blood after the death of the animal, it may be answered, that the arteries are found empty after death in the higher orders of animals. He adds, that he has seen some of the ramifications of those tracheæ which are connected with the cæca, distended with a fluid of the same colour as that found in those organs; and though he has only witnessed this in two instances, yet such a fact even singly taken, must be allowed to be of considerable importance.

The author then adverts to the objections which may be urged against the hypothesis of the transudation of chyle through the coats of the intestines, trusting that his opinion of a sanguineous circulation in insects will not be hastily rejected; and concludes his paper with a description of the nerves and of the sexual organs of the insect; and with some remarks upon the organ of sound, which he considers as produced by the wings, and in no way connected with a peculiar tense membrane, situated between the fourth and fifth stigma on each side of the abdomen.